GPG376

Good Practice Guide

A strategic approach to energy and environmental management

ACTIONenergy
From the Carbon Trust

Contents

This Guide is derived from, updates and replaces two previous Action Energy publications:
***GPG186** - Developing an effective energy policy; and*
***GPG200** - A strategic approach to energy and environmental management.*

1 Introduction

Energy and environmental management are issues that are already on the agenda for many leading UK and global businesses. But these are issues that affect all organisations - large and small.

There are many good reasons why you should think very seriously about 'greening' your organisation, but for most companies the financial benefits will be a key motivator.

Over the past 20 years, government-funded studies of energy efficiency campaigns have found that most companies can save up to 20% on their fuel bills simply by 'managing' their energy use, and investing in cost-effective energy efficiency measures. Every pound saved is a pound on the bottom line. In fact, since the introduction of the Climate Change Levy in 2001 *(see box opposite)*, it's even better than that, because you'll cut the amount of levy you pay too.

Of course, reducing energy usage has a positive effect on the environment, because using less fuel means lower carbon dioxide (CO_2) emissions *(see box opposite)*, but there are many other ways that your organisation can reduce its environmental impact and save money - using less water, or cutting down on paper usage are good examples.

World-wide, governments are becoming aware of the need to conserve natural resources and protect the environment. There are already many stringent national and international laws that regulate emissions of certain substances, and the EU Integrated Pollution Prevention and Control (IPPC) regulations already require operators of some regulated processes to demonstrate that energy is managed effectively. International targets have now been agreed for CO_2 emissions, and for other environmentally harmful practices.

So far, the international community has relied on voluntary actions to achieve these targets, but local legislation has not been ruled out.

Another factor to consider is 'the public'. Public awareness of environmental issues has risen tremendously, and there is very strong evidence that companies who take 'corporate social responsibility' seriously have a distinct advantage in their market place. Corporate social responsibility, or CSR, is an ethos that pervades all aspects of the company's business - from use of materials and resources, through recycling and control of emissions, to travel and workforce demographics. Energy and environmental management are an integral part of this ethos. At the same time, pressure for CSR is also growing from the supply chain. For example, some companies will only use suppliers who operate an 'environmental management system' (EMS) or who are working towards introducing one.

Although the key benefit of energy and environmental management is clearly financial, we should not overlook the 'below-the-line' organisational benefits that may also result. A company that pays attention to managing one resource will quickly learn that such techniques can manage other resources. Indeed, the structure of the internationally recognised 'environmental standard' ISO14001 is very similar to the structure of the 'quality' standard ISO 9001.

So, efficient use of energy, and careful management of environmental impacts can ultimately mean a more efficient business all round.

Energy usage and climate change

Burning the fossil fuels that power our businesses, our transportation systems, and our homes releases carbon dioxide (CO_2) into the atmosphere, where it prevents the sun's heat from dissipating – a process commonly known as the 'greenhouse effect'. The scientific evidence is growing that man-made greenhouse gas emissions are having a noticeable effect on the earth's climate. For example, globally, seven of the ten warmest years on record were in the 1990s.

Scientists predict that global temperatures could warm by 1.4 to 5.8˚c over the next 100 years, depending on the amounts of greenhouse gases emitted and the sensitivity of the climate system. The social, environmental and economic costs associated with this could be huge.

The international community has agreed to try to reduce this threat. The Kyoto Protocol, agreed in 2001, sets a target for developed countries to cut overall greenhouse gas emissions by 5.2% below the 1990 baseline by 2008-2012. In the longer term, bigger cuts worldwide – perhaps 60% or more – will be needed, and the UK has set a domestic goal to go further than the Kyoto commitment and cut emissions of carbon dioxide by 20% below 1990 levels by 2010.

In order to encourage businesses to take up this challenge, the UK government introduced the Climate Change Programme in April 2001. This Programme includes:

- the Climate Change Levy (CCL), which typically adds around 15% to the non-domestic fuel bills of all businesses
- climate change agreements, where eligible businesses (e.g. in energy-intensive industries) can secure an 80% discount from the levy if they agree to meet challenging targets for improving their energy efficiency or reducing carbon emissions (targets are set through negotiations between government and trade bodies)
- a greenhouse gas trading scheme, which enables successful savers to gain financial reward for their efforts by selling their 'surplus allowance', while expanding businesses can purchase an additional allowance
- an Enhanced Capital Allowances (ECA) scheme that helps to promote energy-saving technologies.

For more information on the Climate Change Programme, visit **www.defra.gov.uk/environment/climatechange/index.htm**. The Energy Technology List (ETL) of products that are covered by the ECA scheme can be found at the ECA website: **www.eca.gov.uk**

How to use the guide

This guide describes a five-step approach to introducing energy and environmental management. The five-step approach fits in well with other management programmes. It has been tried and tested by hundreds of organisations across the UK, including the four described in the case studies at the back of this guide.

The guide is written for those who are new to this type of strategic approach, but if you have already begun to save energy, the guide and case studies will give you some ideas of how to enhance your programme so that you can achieve even greater savings.

How you use this Guide depends on how far your organisation has already reached in looking strategically at energy and environmental management. Therefore, a good starting point for all readers is to complete the energy and environmental management matrices on pages 6 and 7 (choose whichever is most appropriate to your needs) to assess your current level of organisation.

- *If your organisation is operating mainly at Level 0 and 1, you should work right through the guide to gain a full understanding of how to develop and implement a successful strategy*
- *If your organisation is operating mainly at Level 2, you may prefer to start at Step 3 – Plan and organise*
- *Mainly Level 3 and 4? You're doing very well, but your strategy may be in need of a face-lift. Use Steps 4 and 5, and the case studies as a source of fresh inspiration.*

2 The energy and environmental management matrices

The energy management matrix was developed in the early 1990s as a tool to help companies to assess their strengths and weaknesses. The environmental management matrix has a similar purpose, and will be useful for companies that are not currently in the process of introducing more sophisticated environmental management systems. (Working towards, or maintaining, certification to ISO 14001 or EMAS requires more specialised management assessment tools).

How to use the matrices

The matrices are shown on pages 6 and 7.

The energy management matrix covers six main areas of energy management:

- Policy – effective management starts with the publication of a policy statement
- Organisation – the organisation of people, the allocation of responsibilities, and the integration of other management functions
- Motivation – the channels of communication used by staff at all levels for energy issues
- Information systems – how energy performance is monitored and reported
- Marketing – how energy awareness and achievements are publicised within the organisation and outside it
- Investment – the policy and provision for investment in energy saving.

There are five levels of performance, ranging from Level 0 where there is no provision for energy management to Level 4 representing best practice. For each area, decide which phrase best describes your organisation, and mark that box. Then assess your scores. For example, scoring mostly Level 2 would be typical of organisations that are watching their expenditure on energy and may be reducing costs through competitive tendering of gas and electricity supplies, but are not necessarily reducing energy consumption.

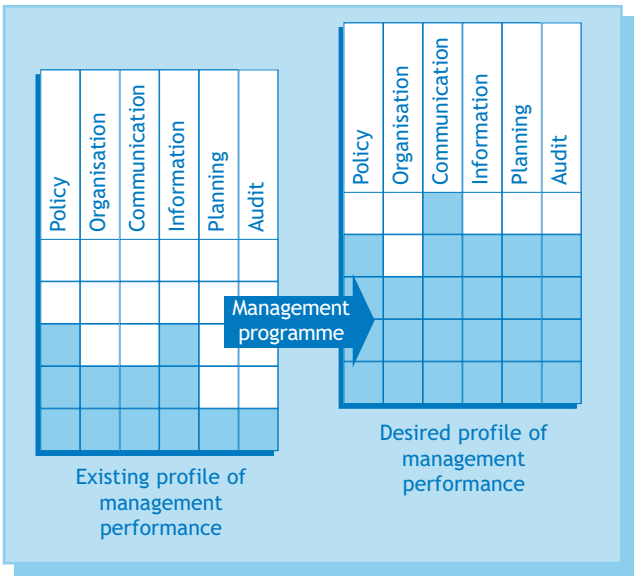
Your target will not necessarily be Level 4 in each area – that will depend on the needs and nature of your organisation.

The combined energy and environmental matrix is similar but covers a broader range of activities:

- Policy – as energy management matrix
- Organisation – as energy management matrix
- Communication – listening to stakeholders and influencing the way environmental issues are managed
- Information – gathering and recording data, and putting it to work constructively, in areas such as training, monitoring, and measuring management performance
- Planning – looking ahead to anticipate future resource requirements, planning for future environmental regulations, and investing in energy-saving or environmental control technologies
- Audit – systematic reviews of management performance against internal and external standards; the route to continuous improvement.

Having completed a matrix, you can begin to design an implementation strategy with a clear starting position and desired end point in mind. But don't forget to revisit the matrix periodically so that you can measure progress against your organisation's objectives.

Fig 1. Use the matrix to assess your progress



Energy management matrix

	Policy	Organisation	Communication	Information	Planning	Audit
4	Energy policy, action plan and regular review have commitment of top management as part of an environmental strategy.	Energy management fully integrated into management structure. Clear delegation of responsibility for energy consumption.	Formal and informal channels of communication regularly exploited by energy manager and energy staff at all levels.	Comprehensive system sets targets, identifies faults, quantifies savings and provides budget tracking.	Marketing the value of energy efficiency and the performance of energy management both within the organisation and outside it.	Positive discrimination in favour of 'green' schemes, with detailed investment appraisal of all new-build and refurbishment opportunities.
3	Formal energy policy, but no active commitment from top management.	Energy manager accountable to energy committee representing all users, chaired by a member of the management board.	Energy committee used as main channel together with direct contact with major users.	Monitoring and targeting (M&T) reports for individual premises based on sub-metering, but savings not reported effectively to users.	Programme of staff awareness and regular publicity campaigns.	Same payback criteria employed as for all other investment.
2	Unadopted energy policy set by energy manager or senior departmental manager.	Energy managers in-post, reporting to ad-hoc committee, but line management and authority unclear.	Contact with major users through ad-hoc committee chaired by senior departmental manager.	M&T reports based on supply meter data. Energy unit has some involvement in budget setting.	Some ad-hoc staff awareness training.	Investment using short-term payback criteria only.
1	An unwritten set of guidelines.	Energy management the part-time responsibility of someone with only limited authority or influence.	Informal contacts between engineer and a few users.	Cost reporting based on invoice data. Engineer compiles reports for internal use within technical department.	Informal contacts used to promote energy efficiency.	Only low-cost measures taken.
0	No explicit policy.	No energy management or any formal delegation of responsibility for energy consumption.	No contact with users.	No information system. No accounting for energy consumption.	No promotion of energy efficiency.	No investment in increasing energy efficiency in premises.

Energy and environmental management matrix

	Policy	Organisation	Communication	Information	Planning	Audit
4	Signed, adopted and publicised policy, detailing a continual improvement programme, and how this is to be achieved. Regularly reviewed and disseminated.	Overall responsibility for energy efficiency and environmental protection assigned to senior managers. Line managers have responsibilities in job descriptions and performance appraisals.	Regular and positive two-way reporting with all stakeholders. Established internal communication and reporting channels.	Environmental management manual exists, detailing action plans, work procedures, policy. Procedures for abnormal/emergency operating conditions.	Future resource requirements identified. Long-term investment in energy efficiency and environmental protection, to gain competitive advantage.	Audit programme conforms with BS 7750, EMAS requirements. Auditors are experienced, trained and independent of auditable facility. Audit findings are built into a dynamic action plan.
3	Signed policy, detailing energy and environmental management options. Irregularly reviewed and limited knowledge of its existence and purpose.	Energy and environmental management function, separate from line management. Defined responsibilities for some line managers regarding environmental issues.	Positive dialogue established with regulatory authorities. Regular reports on relevant issues to senior management.	Operational procedures for some activities, but not formalised into manual. Monitoring and control details maintained for energy consumption and regulated emissions and discharges.	Regular review of all stakeholder needs, including legislation and associated liabilities, and potential cost savings attributable to environmental management. Provisions made for future spending on projects with short payback.	Site specific audit programme which generates corrective actions, and is reported to senior management. Audits identify non-compliance with regulations, policy and industry good practice.
2	Signed policy statement. No details on how to achieve stated position. Limited adoption and distribution.	Responsibility for energy and environmental management delegated to one professional with some experience or training.	Irregular dialogue established in response to specific requests for information. No communication established between senior management and workforce.	Records and documentation are maintained where they relate to financial control or regulated activities.	Environmental liabilities understood, Investment is geared to regulatory compliance or cost reduction for current activities.	Periodic environmental audit programme to determine compliance with regulations. Energy audits limited to review of total spend and simple facility 'health checks'.
1	Informal set of guidelines about organisation's position on energy efficiency and environmental protection. No specific policy, issues addressed in an ad-hoc fashion.	Informal and uncoordinated arrangements for energy and environmental management. Responsive to issues as they arise.	Irregular communication and patchy reporting channels established. Senior management only request environmental information after an incident.	Information, documentation and recording system is uncoordinated and informal. Environmental issues are not addressed in operating procedures.	Limited assessment of environmental liabilities, or potential cost savings. No resources allocated to environmental management.	No audit programme. Infrequent environmental inspections carried out. Focus on regulations. No corrective actions identified or reported.
0	No written policy statement.	No resources for managing energy and environmental issues.	No contact with regulatory authorities or general public. Lack of knowledge/ awareness regarding environmental affairs.	No documentation exists. No records of energy consumption or environmental monitoring.	No knowledge of environmental liabilities, or potential savings from improved efficiency.	No management audit carried out.

3 The five-step approach – an introduction

Management programmes only succeed in delivering performance improvements when there is a clear sense of direction, and when the programmes provide strategic overviews of the actual process of achieving improvement.

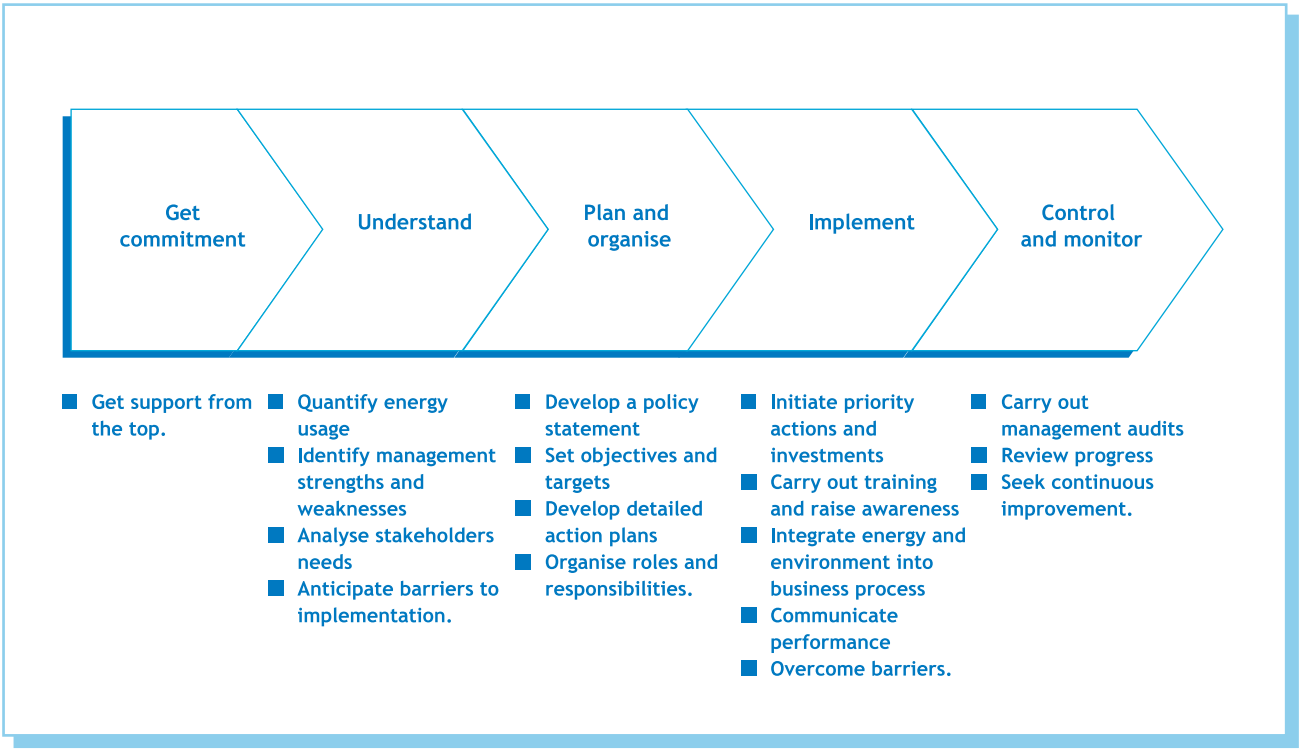
The five-step approach to energy and environmental management will be familiar to anyone who has ever implemented 'change management' or quality management schemes in their business. This approach will keep the management process on track and help to avoid the many barriers that hinder progress.

ISO9001/14001

The management systems within an organisation can often be successfully merged. For example, quality management systems to ISO 9001 are very similar in structure and approach to environmental management systems to ISO 14001, and the two can be combined as one system. Indeed, some of the procedures required for ISO 9001 can be the same as for ISO 14001.

If your organisation already has an established ISO 9001 or ISO 14001 system, it is logical to apply the same approach to energy and environmental management.

Fig 2. Five-step approach to energy and environmental management



4 Step 1 Get commitment

Commitment from someone at the highest level of your organisation (for example, a board member or the managing director) is essential for the long-term success of your energy and environmental strategy. Their commitment will demonstrate the importance of the programme, and their backing will assist the managers who will be actively involved in implementing the strategy.

How can you secure this commitment? A first step might be to provide senior management with a clear understanding of the benefits that might accrue. Typical benefits were discussed briefly in Chapter 1. The Case Studies in this Guide give further examples. In addition, Action Energy has published many other case studies that detail the energy and environmental management achievements of organisations large and small (visit **www.actionenergy.org.uk** to order copies). Use any of these examples to help secure top-level support.

Use your preliminary research to compile a short list of the actions that your campaign might involve. In particular, highlight no-cost and low-cost measures that will bring immediate savings (e.g. switching off lights that are not being used; repairing dripping hot-water taps). If possible, give an estimate of how much these actions might save. (Action Energy's website has plenty of typical figures).

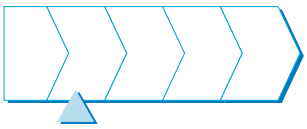
Be aware that 'commitment' is more than a statement of support – it should establish accountability among managers involved in the implementation of the strategy, and should require regular reporting on progress. Having an 'energy champion' on the board is an excellent way of sustaining this commitment.

In addition to top-level commitment, staff from all levels of the organisation need to be encouraged to join your campaign. The best way to do this is for them to 'buy in' to the programme. This comes later in the strategy and is discussed in Step 4.

Action points

- **Identify someone at the highest level of your organisation who has responsibility for energy or an interest in energy and environmental issues**
- **Prepare a short summary of the benefits that your strategy will bring, and add a 'briefing note' about the kind of actions that might be necessary**
- **Compile a list of exemplars to back-up your case**
- **Present this preliminary research when you make your case to the 'energy champion'.**

5 Step 2 Understand



Having completed the energy or environmental management matrices on page 6 and 7, you will already have a rough idea of how far your organisation has moved towards becoming a greener business. The next step is to conduct a more thorough review of the current position, where you want to go, and how you will get there.

Before you go any further, it is essential that you have a clear understanding of how energy usage and environmental issues affect your organisation.

- Is energy usage an essential resource for a manufacturing process? If it is, usage may fluctuate with production requirements, but you will still have a fairly constant baseline demand (for heating, lighting, office equipment and so on)
- Does legislation affect your organisation (e.g. pollution control, landfill tax, safety-critical operation)?
- Would your organisation benefit by being 'seen to be green'? If so, achieving accreditation under the Energy Efficiency Accreditation Scheme or achieving ISO 14001 accreditation will be important
- Could your organisation obtain a CCL rebate if it signed up to a climate change agreement with a relevant trade association?

Benchmarking current performance

You also need to understand the current energy and environmental performance of your organisation. This will involve collecting data. But before you start gathering figures, it is important to look at the broad context so that you can assess which data will be most important and how much of it you will need to collect.

Environmental information that you should collect at this stage might include:

- estimates of atmospheric emissions, effluent discharges and waste disposal
- typical consumption of raw materials
- energy data.

You may find that trends or questions emerge quickly, simply by looking at year-on-year data. (Remember to relate the data to an appropriate output – e.g. turnover, number of patients treated, tonnes of material processed).

For example, Action Energy publishes energy consumption benchmarks for various types of buildings and for manufacturing processes. Choose benchmarks appropriate for your organisation, and collect enough energy usage data to enable you to make a good comparison against the 'headline' benchmarks. There is no need to go into great detail at this stage.

The benchmarking process will give you an indication of the potential financial benefits that you might be able to achieve, and it may immediately highlight some areas that should be investigated further.

Identifying stakeholder needs

Interest in energy and environmental management extends beyond the boundaries of the organisation and understanding the needs of these individuals or bodies (the stakeholders) can help shape your strategy.

Stakeholders include:

- customers – who buy goods and make use of services
- investors – shareholders, banks and the financial community in general
- taxpayers – who fund public services
- employees – who work in the organisation
- the community – neighbouring residents, businesses and public services.

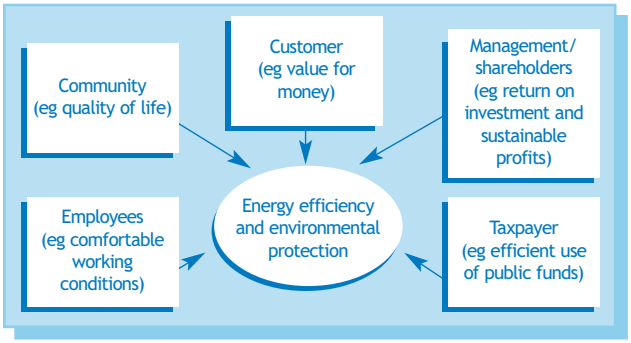


Fig 3. Summary of stakeholder needs

Identifying barriers to progress

Arguably the most important task at this stage is to understand the barriers that you may face. Indeed, you may have already encountered some barriers at Stage 1.

There will be many reasons why people think that they need not take energy and environmental management seriously. These will largely be based around ingrained attitudes, such as 'energy is not a priority' or 'we are already energy efficient', or popular misconceptions (e.g. switching off fluorescent lights doesn't make much of a saving), or simple ignorance of the link between energy use and climate change. You should anticipate these barriers so that they can be countered.

Common barriers are listed in Figure 4.

There is no doubt that, if your strategy is to be successful, you need to encourage 'buy-in' at all levels in your organisation. Planning to avoid barriers is only half the story; you also need to decide on the best way to work within your organisation's existing structure and 'culture'.

Most organisations have an identifiable culture.
The culture can be neatly summarised by answering 'yes' or 'no' to two questions:

- Does your organisation thrive on risk-taking?
- Does it take a long-term view?

Link these questions to Figure 5, and a picture of your organisation's 'culture' will begin to emerge. Where does it fit in the grid?

For a rather more considered approach, try this: tick one box in each row of Table 1, then sum the ticks in each column. The highest scoring column indicates the dominant culture in your organisation.

Fig 4. Some common barriers and misconceptions

- The effort of the individual will make no difference
- The return does not justify the effort
- Management has more important issues to address
- Energy efficiency is discretionary
- Energy and environmental investments are high risk
- Nobody thinks it's an issue
- We don't have the time and resources
- Issues are not reported effectively
- Staff are apathetic towards energy and environmental issues
- There is no value for the individual
- Senior management only pay lip service
- There is no clear responsibility or accountability
- Middle management is overloaded and fails to act on senior level commitment
- The subject is technical and peripheral to the business
- The organisation lacks the necessary technical skills
- The organisation has no money to invest
- There is no opportunity for staff involvement
- There is no workable policy
- Targets for saving are unrealistic or unrelated to business needs
- There is no competitive edge to be gained
- There is a lack of appreciation of contribution to bottom line amongst general and financial managers.

Fig 5. What's your corporate culture?

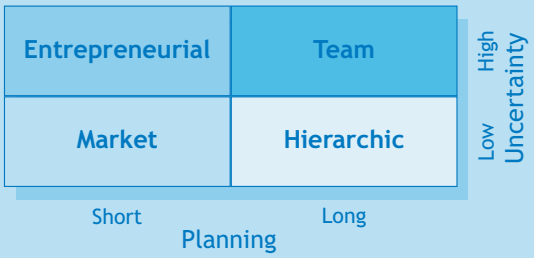


Table 1 Common features of corporate cultures

	A	B	C	D
Cultural characteristic	innovation/growth ☐	participation/co-operation ☐	structure/control ☐	productivity/achievement ☐
Focus	anywhere outside ☐	staff-orientated ☐	organisation-orientated ☐	towards competitors ☐
Planning	very short-term ☐	long-term ☐	medium-term ☐	short-term ☐
Risk tolerance	tolerates high risk ☐	tolerates uncertainty ☐	needs certainty ☐	prefers predictability ☐
Leadership	charismatic ☐	supportive ☐	conservative ☐	managerial ☐
Structure	flexible ☐	co-operative ☐	rigid ☐	cost-centres ☐
Authority	personal ☐	meetings ☐	rules ☐	delegated ☐
TOTAL	☐	☐	☐	☐

In practice, most organisations contain a mixture of cultural characteristics, but the items you have ticked will indicate important trends.

• **Column A** – *Entrepreneurial*. Distinguishing characteristics – innovation and growth. It is outward looking, planning is short-term and there is a high tolerance of risk. Leadership is charismatic, the structure is flexible and control is often still in the hands of the founder members.

• **Column B** – *Team*. Characterised by participation and co-operation. Focus is inward and staff-orientated. Planning is long-term and risk is tolerated. Leadership is supportive and the structure resembles a co-operative in which staff are motivated by collaboration. Authority tends to be vested in meetings rather than individuals.

• **Column C** – *Hierarchic*. A much stronger emphasis on structure and control; the main objective is organisational survival. Planning is medium-term and there is a much stronger need for security and certainty. Leadership is conservative, authority tends to be vested in rules, and there are long-established customary ways of doing things.

• **Column D** – *Market*. A strong emphasis on productivity, competence and achievement. Attention is focused on the market and the competitor's position in the market. Planning is more responsive and short-term. Leadership and authority are delegated to departmental heads who have to meet performance targets.

Knowing more about the particular culture you work in can help you to understand how best to go about devising and implementing an energy or environmental policy. For example, energy managers from twenty 'leading edge' organisations with different corporate cultures (in the public and private sectors) were asked to describe how they devised and implemented an energy policy. The results, summarised in Figure 6, clearly illustrate how the energy managers tailored their approach to suit their corporate culture.

Fig 6. Working within a culture

	Entrepreneurial	Team	Hierarchic	Market
Initiative	Charismatic leader	Ground swell from staff	Perceived external threat	Middle management, with board backing
Slogan	'Stand up and be counted'	'Create a shared feeling of ownership'	'Safe rather than sorry' compliance with regulations	'As good or better than our competitors'
Champion	Director as champion	Steering committee	Key individual	Middle managers
Input	From relevant heads of departments	Local working groups	Sub-committee	Delegated 'going green' task force of middle managers
Objectives	Reduce business costs and environmental impact and improve market position	Improve well-being of organisation and staff	Safeguard existence through gradualist improvement	To improve market position
Targets	Set by technical staff	Widely agreed by all staff as achievable	Formally set by sub-committee and ratified from above	Measurable performance related targets set by task force
Responsibility for policy	Senior individual	Tough but agreeable senior manager	Line management structure	Task force
Responsibility for usage	Departmental heads	Each and every member of staff	Usually premises staff	Budget holders
Motivation	Support corporate position	Involve staff through recognition of their group achievements	Promotional campaigns. Praise for those taking action	Performance related pay
Reporting	User friendly monthly reports	Feedback through local working groups	Tailored information provided on a need-to-know basis	Existing reporting to middle managers, broad statement to board
Marketing	Glossy annual report to all staff, customers and general public	Annual report to all shareholders	Annual report	Environmental report, audited externally to ensure honest disclosure
Support	Staff training in corporate attitudes/ behaviour	Appropriate training and resources allocated	Formally established procedures	Staff awareness training in performance achievement

Action points

- Identify the energy and environmental issues key to your organisation
- Collect data and benchmark current performance against published data for other similar organisations and industry best practice
- Identify the most important stakeholders and their interests
- Identify potential barriers to progress
- Identify your organisation's culture so that planning can work within this instead of against it.

6 Step 3 Plan and organise

Strategic goals will only be achieved if they are driven day-to-day by tactical actions, which must be carefully planned.

This Step is the most detailed of all, and covers:

- producing a policy
- setting objectives and targets
- developing a detailed action plan
- assigning roles and responsibilities for key functions.

Writing the policy

A coherent and effective policy provides the foundation for the rest of your plans. Figure 7 shows the five key attributes of successful policies.

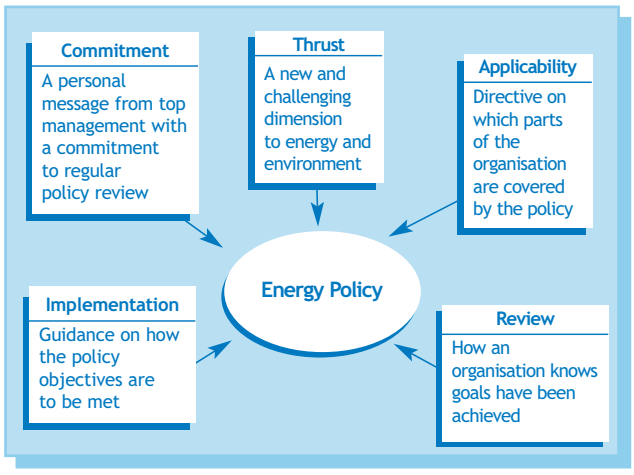


Fig 7. The five key attributes of an energy and environmental policy

Many organisations have separate energy and environmental policies, and although energy and environment are closely linked, having separate policies can make implementation easier. Nevertheless, some organisations combine energy and environmental management, but often one was implemented first and drove the other. For example, where an organisation has implemented an environmental management system, it is common to find that this has subsequently driven the implementation of energy management, especially where environmental image has been the key driver. On the other hand, organisations with high energy bills might focus on energy first, driven by financial saving. Whatever the case, it is inevitable that energy and environmental management will converge and become integrated at some point.

The rest of this section is based on the formation of an energy policy. However, the same principals apply to the formation of an environmental policy.

The policy should:

- communicate the commitment of senior management
- raise awareness generally
- demonstrate commitment outside the organisation – to clients and suppliers
- provide a foundation for the strategy
- provide a structure for the implementation of the strategy.

Ideally, the policy will comprise two documents:

- part A – a high-level document containing a statement of commitment signed by a board member
- part B – a more detailed document setting out detailed objectives and targets along with a methodology for achieving those (including a list of key members of staff involved in the implementation).

The detailed policy should cover all aspects of energy management from procurement through to point of use and should also include guidelines for new projects and procurement of new plant, where life-cycle energy costs should be considered. This detailed policy will also be underpinned by various planning documents that will not be circulated widely.

The sample policy, which follows, could be used as a template, or if your organisation already has a policy, you could use it as a checklist to see if further changes are needed.

Sample energy policy[1]

(PART A)

1. Mission statement[2]

2. Statement of commitment

We are committed to:

- purchasing energy at the most cost-effective price
- purchasing a proportion of green energy (generated from renewable sources)
- increasing energy efficiency in terms of energy consumed per unit of production (or per Degree Day for space heating)
- reducing CO_2 emissions
- investing in new technology where this meets investment criteria (including renewable energy sources)
- considering life cycle energy costs when procuring new projects
- purchasing energy-efficient plant and equipment (including office equipment)
- reducing environmental emissions associated with travel (including employee travel to work, business travel and distribution of goods)
- entering into a climate change agreement via our trade association
- investing in energy-saving technologies that are eligible for enhanced capital allowances.

We will address energy efficiency in all areas of our business including:

- Management issues
  - define roles and responsibilities for energy
  - educate and raise awareness among staff
  - encourage continual professional development (CPD) for technical staff involved in energy
  - establish clear reporting procedures
- Procurement issues
  - procure equipment with low energy ratings
  - consider life-cycle energy costs for new projects and modifications to existing plant
  - establish technical guidelines for new projects and refurbishment
- financial issues
  - establish ownership of energy costs at departmental level
  - establish ownership for invoice verification
- technical issues
  - establish procedures for operation of plant and equipment.

We will improve on past performance.

Over the past 5/10 years:

- our energy costs have increased/decreased by x%
- our energy efficiency has increased/decreased by x%
- our emissions of CO_2 have increased/decreased by x%
- our consumption of fossil fuels has increased/decreased by x%
- our consumption of renewable energy has increased/decreased by x%
- our investment in clean, energy-efficient technologies has increased/decreased by x%.

We are committed to reversing/reinforcing/accelerating this trend/these trends through a strategic action plan which will be reviewed for progress and updated each year.

Chairman's signature .....

Date .....

1. Delete or insert list items, as appropriate

2. Optional. Insert a statement explaining how your organisation's goals for energy or environmental management will drive it forward towards achieving its corporate mission statement.

Sample energy policy

(PART B)

3. Corporate policy statement

Our long-term[3] corporate goals are:

- to commit organisational resources to energy management
- reduce our energy costs
- give high priority to energy efficiency investments
- consider life-cycle energy costs for all new projects
- minimise CO_2 emissions
- minimise environmental impact
- where possible, to use energy from sustainable sources.

Our medium-term[4] objectives are:

- publish a corporate energy policy
- reduce environmental impact of fuels used by reducing our emissions of y tonnes of CO_2 by x% over (say) five years
- reduce consumption of energy by x% of y units of energy delivered over (say) five years
- reduce energy consumption to typical/good practice benchmark levels within (say) five years
- purchase x% of our electricity from green sources
- achieve accreditation under the Energy Efficiency Accreditation Scheme
- achieve the emissions reduction target set in our climate change agreement
- implement a regular programme of energy audits
- set and publish performance improvement targets
- report performance changes and improvements annually
- increase staff awareness
- nominate employees to act as departmental energy officers
- seek competitive tenders for gas and electricity supplies
- identify all cost-effective energy efficiency measures
- establish a monitoring and targeting system
- provide regular management reports on costs and consumption
- establish a budget for investing in energy efficiency
- specify energy efficient design of new buildings, and procure energy efficient plant and equipment.

Endorsed by the Board .....

Date .....

3. Typically, long-term goals may be the outcome of a five-year strategic plan.

4. Often expressed in terms of, say, a percentage reduction in energy consumption or CO_2 emissions. Where this is done, it is important to ensure that targets are realistic and reflect the organisation's potential i.e. they should not be arbitrary figures. Alternatively, reductions can be expressed in terms of improvement compared with benchmarks. This will help you to avoid setting unrealistic targets if performance is already quite good, but will set larger improvements if performance is poor. Other key performance indicators (KPIs) could be used. For example:

- *percentage of annual energy expenditure invested in reducing consumption*
- *achieve greater return on investment in improving energy efficiency*
- *number of key personnel given energy training*
- *measure increase in staff awareness*
- *number of energy-saving suggestions received from staff.*

Setting objectives and targets

The work you have done so far – to gain commitment, understand your organisation, formulate the policy – will have drawn attention to key areas for action and other issues where there is potential for improvement. Indeed, your policy may have mentioned some of these. But if your organisation is just starting to control its environmental impacts, there may be very many things that could be done, so you will need to prioritise actions and set achievable and realistic targets. Part of the ensuing management process will involve checking whether targets are being met, so it is important to keep good records of these.

When developing targets and objectives, you need to take account of both quantitative and qualitative factors, and pay particular attention to:

- assessing waste reduction targets and calculating the cost and potential returns on investment
- building on management strengths, and identifying and assessing significant gaps in resources
- expressing objectives and targets in ways that provide real incentives for people at all levels in the organisation.

Objectives should be agreed by senior management to ensure that they are given the priority they deserve.

Developing action plans

Once objectives and targets have been agreed, you will need to draw up action plans to define what has to be done. It can be useful to show the action plans in the form of a project plan (e.g. a bar chart).

The documents you develop will include 'cascaded targets' i.e. long-term goals break down to medium-term targets that in turn will be achieved by a series of daily actions. For example, a five-year-plan indicating the milestones and targets is useful to help you identify the main actions required in order to achieve the long-term goals. This should be accompanied by a one-year action plan that shows specific tasks to be undertaken during the first 12 months. A number of these tasks may be repeated in subsequent years. These plans can be accompanied by details of tasks that need to be carried out daily.

Energy and environmental management are not stand-alone activities and must be integrated with your organisation's existing management systems. When developing the action plan, you will need to assign responsibility for specific activities, so it is important to understand which individuals are currently responsible for the disciplines to which the new tasks are related. Table 2 gives some examples.

Table 2 – Examples of existing roles and responsibilities

Activity	Responsibility
Collation of energy and environmental statistics, and production of concise meaningful reports	Financial manager
Applying energy and environmental criteria to selection of suppliers and purchasing of goods	Purchasing manager
Negotiation of energy supply contracts	Purchasing manager
Detailed energy monitoring and target setting	Operational manager
Technical aspects of energy and environmental management	Operational manager
Investigating the possibility of participating in a climate change agreement	Chief engineer
Specifying plant that attracts ECAs	Operational manager
Monitoring the importance of energy and environment to customers	Marketing manager
Develop public reporting on environment	Public relations manager

Although specific tasks are suited to particular departments or individuals, they are interrelated and cannot be discharged in isolation. It is important that individuals discuss, agree and work together to implement the action plan. For example:

- the financial manager will require data from the operational departments in order to produce reports
- the purchasing manager will require information from the operational departments concerning anticipated changes in consumption levels when negotiating energy supply contracts
- the operations manager responsible for the day-to-day management of energy may require specific information from the energy supply companies, and this will need to be written into tender documents issued by the purchasing manager.

You can use a 'roles and responsibilities matrix' (see Figure 8) to help you identify key personnel and assign tasks. It will also identify tasks that can logically be combined. This information will then feed into your action plans.

Action plans can be developed in-house, but some organisations use consultants to help develop the action plan. (Contact Action Energy for guidance). To be effective, the action plans should:

- be agreed and approved at an appropriate level of line management, and roll up to the senior manager who is ultimately accountable for energy and environmental management performance
- relate actions to individual objectives and targets, which in turn can be traced to specific policy commitments
- assign actions to individuals with clear deadlines for reporting progress and completion
- indicate the person responsible for approving or signing off the action when it has been completed
- describe the resources that are available
- input into budget negotiations, in order to confirm that adequate budget provision has been made.

Fig 8. Example of a 'roles and responsibility matrix'

	Function				
Responsible person	Director	Mgr A	Mgr B	Asst C	Asst D
Measure consumption	▲		■		●
Identify energy cost centres			▲	✻	■
Track performance					
Set targets for energy usage					
Develop conservation programme	▲	■		●	
Inspect equipment					
Select projects for improvement					
Allocate budget and resources					
Prepare documentation					
Provide training					
Review new projects for energy efficiency					
Carry out energy management audits					

Key ● Perform work ■ Responsible for work ▲ Approval authority ✻ Provide advice (technical support)

In particular, at this stage, you will need to be quite specific about short-term targets. These will include specific targets to be achieved within the next 12 months, and should be linked to the detailed action plan for that period. Examples of short-term targets include:

- reduce costs by x% in 12 months
- reduce consumption by y% in 12 months
- reduce CO_2 emissions by z% in 12 months

Ideally, you should prioritise the actions needed so that you gain some early ground – this will help keep interest in your campaign. Choose actions that will:

- deliver the highest rewards
- are no-cost or low-cost measures
- can be implemented quickly.

Figure 9 is a typical record sheet that you could use to manage one aspect of the policy. You will need to keep detailed records like this for each policy commitment, and check them regularly to ensure that you stay on track.[5]

Policy commitment .....

Objectives	Targets	Action	Date	Budget	Assigned to:	Sign-off by:

Fig 9. Sample record sheet showing the detailed action plan that will drive day-to-day energy and environmental management

You should also ensure that the action plans pay particular attention to activities during the first few weeks of the campaign. Early success or failure will have a dramatic impact on your campaign over the long-term. It may be helpful to have a separate, detailed plan for the first month, including a launch 'event' to draw maximum attention to your campaign. This is discussed in more detail in Step 4.

Procurement

In some organisations, energy procurement is divorced from energy management to a large extent, and is carried out by a procurement or contracts department that might have little contact with the staff implementing the energy policy. Although supply contracts may be negotiated by the contracts department it is important that this is integrated within the energy management function, particularly because, when setting up the contract, you can specify information that you wish the supplier to provide. (For example, high energy users may wish to have on-line access, via the Internet, to half-hourly electricity demand data).

Organisations may also wish to purchase a proportion of their electricity from renewable sources. (The purchase of this 'green energy' often attracts a cost premium, but it is exempt from the CCL, so the overall effect can be cost neutral).

Action points

- **Produce an energy policy statement, and obtain backing and the signature of the head of your organisation.**
- **Identify objectives and targets, and agree these with senior management.**
- **Complete a 'roles and responsibilities' matrix to help you assign tasks.**
- **Produce detailed individual action plans or procedures for day-to-day management of energy and environmental issues.**

5. Note that, strictly speaking, evidence of compliance with the qualitative requirements (see guidance document CCA 18, available at **www.defra.gov.uk/environment/ccl**) will only be required when, upon failing to meet a quantitative target a participant wishes to take advantage of a tolerance band, where there is such a tolerance band, or wishes to cite a relevant constraint or requirement (as set out in Section 7 of the 'Umbrella Climate Change Agreement'.) However, participants' compliance with the qualitative requirements will be a crucial element in meeting their quantitative targets.
It is also essential for participants to go beyond having policies, plans, and procedures. There must be evidence that these are acted upon, and that there is consequent and related improvement to equipment and its operation.

7 Step 4 Implement

This is the point where all your hard work and preparation should begin to pay off. Indeed, your action plan will have highlighted quick wins – simple low-cost or no-cost measures that will bring immediate savings – and these actions will be your first priority. They will help to educate stakeholders, as well as reinforce the benefits of your campaign. Don't hesitate to promote early wins and reward success. This will encourage people to engage with the campaign and look around for further savings.

Raising awareness

Launching the management programme should be a well-publicised event, and could, for example, include the signing of the policy document – an excellent photo opportunity. Use your organisation's staff newsletter or the e-mail system to promote the event, and get the local press involved to help you communicate with external stakeholders.

If your organisation does not have a well-established corporate communications system, Action Energy has produced an 'activity pack' that will help you publicise your campaign.The pack includes templates for energy newsletters and posters, and includes a wealth of tips for launching and sustaining your campaign (order copies of 'Marketing energy efficiency – raising staff awareness' (GPG172) from **www.actionenergy.org.uk**).

Raising awareness is by no means a one-off activity, and you will need to maintain the level of awareness throughout the programme. Talk to your colleagues to gain ideas on how best to achieve this in your organisation.

The greatest success will be realised by achieving the 'buy-in' of staff at all levels, and creating a sense of ownership of energy and environmental issues. This can be achieved as part of quality management initiatives, but in organisations where such initiatives do not exist you may need to run a series of training/awareness sessions, or ensure that team leaders include a discussion of your campaign in team meetings.

The awareness programme should:

- build greater understanding of the importance of energy efficiency and environmental protection, both locally and globally
- create a sense of ownership of your management programme and the results it delivers
- disseminate technical information
- focus attention on key issues
- demonstrate how individuals can help.

Action Energy's Case Studies also offer many ideas for launching and sustaining campaigns.
For example:

- Simple suggestion schemes can be used to create a sense of ownership. (Initiatives that have been identified by operational staff often prove to be much more successful than those imposed from above)
- Generate a sense of competition between departments, cost centres or across sites, by publicising details of their energy or environmental performance
- Encourage staff by offering to donate a proportion of savings to a particular charity.

Don't overlook the value of staff induction sessions – this is an excellent opportunity to spread the campaign's message to new staff (who, in turn, are often in a good position to question established practices).

In addition to general awareness training, more specific training may be required for staff actively involved in daily energy and environmental management. This may include training on technical issues for operational and maintenance staff, auditor training and training on environmental legislation.

Publicising performance

Publicising performance, both good and poor, is essential if you are to sustain the momentum of the programme. Spreading good news ensures that stakeholders know that their interests are being addressed and provides encouragement to all who have contributed to that success; highlighting poor performance can, if treated sensitively, help encourage improvement.

When publicising any aspect of the campaign, you must consider the needs of the target audience, or stakeholder, and the information you provide should match their needs. For example, senior management will find performance expressed as cost savings most useful, while local residents will be more interested in reductions in emissions to the environment. Customers may be interested in the life-cycle characteristics of products, and their own environmental initiatives (e.g. ISO 14001) will drive their interest in the environmental performance of your organisation. Here, achievements such as accreditation under the Energy Efficiency Accreditation scheme, and progress towards an environmental standard can help with your marketing.

Any reports you produce must be concise and easy to understand in order to maximise effectiveness.

In manufacturing organisations, the quality management systems for production performance are often displayed on 'quality' notice boards in each department. These provide useful areas to display energy and environmental performance information.

Overcoming barriers

Implementing the energy and environmental management programme inevitably leads to changes, many of which may not be immediately welcome. Getting people to 'buy-in' to new ways of working means changing existing attitudes and behaviour. Attempts to force these changes quickly will rarely succeed in the long run.

During the planning stage, you will have identified potential barriers and ways that you might overcome these. Undoubtedly, the greatest success will be achieved by encouraging new attitudes and behaviour. To do this, you will need to 'sell' the benefits – leading people towards the benefits of a new approach rather than pushing them into change is more successful (see Figure 10).

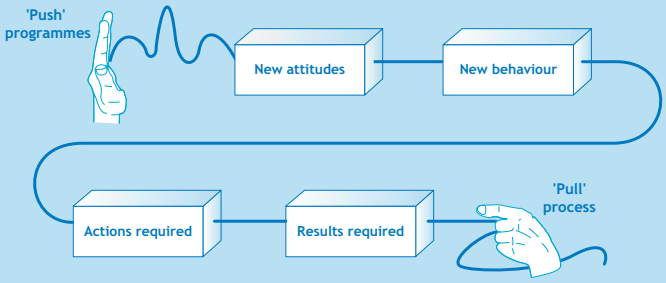
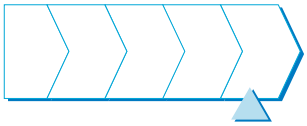


Fig 10. Staff should be 'pulled' along with your campaign to achieve all round performance improvement, rather than 'pushed' by enforced behavioural changes

Action points

- Use the launch event to generate awareness and motivation
- Follow this up with awareness training
- Encourage ownership of energy at all levels
- Provide training for staff involved in technical aspects of energy management
- Integrate energy management into the organisation's existing management systems
- Work with everyone in your organisation to identify opportunities for savings
- Publicise successes to stakeholders.

8 Step 5 Control and monitor



Control and monitor

The plans made at Step 3, particularly the detailed action plans (see Figure 9), will help to keep you on track as the weeks go by, but there will inevitably come a point where a more detailed overhaul is required. A 'management audit' is a systematic review of the programme's performance against both legal requirements and corporate policy objectives, and it is an excellent opportunity to reinvigorate a campaign.

Auditing the programme

The audit provides verification that the systems you have set in place are being followed. It identifies areas where corrective action is required and it highlights opportunities for improvement. Some organisations include the requirement for a management audit in their policy, so that performance is regularly reviewed and communicated up the management line, and so that actions are triggered to deal with unsatisfactory performance.

Audits generate valuable feedback that can then be used to:

- reaffirm top-level commitment
- review and amend the policies and objectives
- revise action plans
- redefine roles and responsibilities
- amend reporting arrangements.

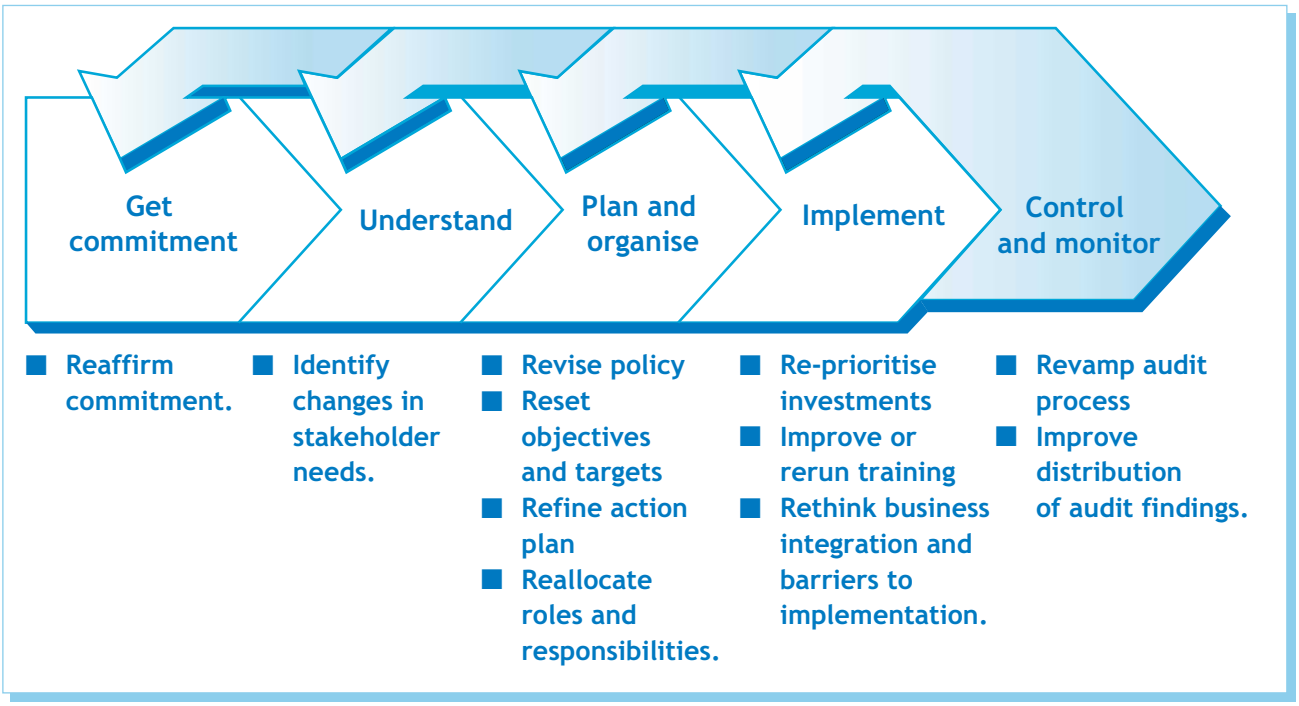


Fig 11. Effective control monitoring of an energy or environmental management programme is the vehicle for feedback and continuous improvement

Many organisations will already be familiar with the concept of a 'management audit'. Such audits are common for health and safety or quality management programmes, for example, and those organisations with ISO 14001 accreditation, are required to commission six-monthly audits by the external assessor, in addition to their own internal audits. However, others may find the concept daunting – but this need not be so. It could be as simple as one 'auditor' talking to individuals to check that actions have been taken, and if not, discussing why and whether alternative measures can be introduced.

It is important that the audit procedure is standardised in the form of an 'audit protocol'. The protocol will describe when and how to conduct the audit and what feedback should be gathered. To be of any value, the audit must be carried out systematically and consistently. The protocol will ensure that this is achieved. For larger organisations the protocol is essential to ensure that different areas of the business follow the same auditing system so that you can make company-wide comparisons. Some multi-sited organisations use software-based auditing tools, and generate a score for the site's performance.

Auditors will need to interview personnel, review documents and make observations, so they should have appropriate technical and professional skills.

The management audit usually comprises:

- Pre-audit – where the terms of reference are agreed, and the site is informed of the information that will be required during the audit
- Site audit – where the auditor(s) interviews key members of staff and reviews evidence in order to verify compliance or identify instances of non-conformity
- Post-audit – where the findings and recommendations of the audit are fed back to local management so that corrective action can be taken.

The audit can use questionnaires and checklists and will aim to confirm:

- compliance with the aims of the policy statement
- compliance with regulations and legal requirements
- verification that agreed procedures are being followed.

The findings of the audit should be summarised in a report that highlights areas of non-compliance and indicates the necessary corrective action. Corrective action or recommendations may be prioritised within the report.

Once a management audit process is in place, particularly if you make it a policy commitment, the process is self-sustaining, and energy and environmental protection should become integral parts of everyday management, contributing to enhanced profitability and service delivery.

Energy management

Energy management professionals are generally familiar with the concept of monitoring and targeting (M&T). This is the process whereby energy usage data (e.g. from meter readings) is collected and analysed to identify performance improvements or areas of weakness. Data can be compared year-on-year, per unit of production, against turnover; whatever measure best suits the organisation. As we have seen, monthly analysis for example, can be helpful if it is used to maintain staff interest in the campaign. It can highlight areas of unexpected consumption – external lights left on during the day, for example. But over the long-term, such data can be used to pinpoint areas where improvement is essential – in working practices or to plant.

Action Energy's Energy Consumption Guides explain how to gather and analyse data for a range of building types and industry sectors. Action Energy also runs a free energy survey scheme.

As with the management process, you should plan to conduct a regular, detailed 'energy audit'. The frequency of auditing will depend on the nature of your organisation and will be influence by significant changes in its operation, but for most organisations a minimum of two audits over a five-year period should be considered.

Key performance indicators

It is relatively easy to collect a great deal of data on energy consumption, emissions or waste generated and present your findings in management reports, but this in itself does not tell management how the programme is performing or how your organisation is performing compared to others. Key performance indicators (KPIs) can be used to provide a measurement of this. However, it is worth noting that 'enforced' KPIs will have a significant impact on behaviour, so it is important to choose the right ones. Examples include:

- Level of staff awareness/ownership – measured by issuing a questionnaire to all staff (or a representative sample of staff in a large organisation). This not only provides a measure of current awareness but also serves to further raise awareness
- Percentage of actions achieved on time – completion of specific projects identified on the action plan, completed on schedule
- Percentage of management reports delivered on time
- Number of non-conformance incidents identified during management audit – this could be expressed as a percentage score for the audit
- Comparison against good practice – by comparing the organisation's benchmark against published benchmarks for similar organisations
- Scope for improvement – identified by a detailed survey and expressed as a percentage of the current level of energy consumption.

Reporting KPIs can be very helpful when preparing reports for senior managers who do not need to know the detailed energy data. They can also be useful marketing 'facts' to demonstrate performance improvements to external stakeholders. With this in mind, it is a good idea to ensure that you plan to gather this type of information during a management, energy or environmental audit.

Revisiting the matrices

The audit is also an appropriate point at which to revisit the energy or environmental management matrices to assess how far you have progressed and how much further you wish to travel. Again, a simple 'plot' of your organisation's position on the matrix (see Figure 1) can be an ideal introduction to a report for senior management or external stakeholders.

Action points

Include auditing in your corporate policy.

- Produce a procedure and format for management audits – ideally align your procedure with existing audit protocols
- Use on-going M&T to keep track of energy usage, and feed back data to those responsible for its use
- Use key performance indicators to assess performance, and to provide quick and meaningful feedback for stakeholders
- Use the energy and environmental matrices periodically to measure progress against objectives.

Case Study | 1

"The key to the success of our energy plan has been involving and motivating staff."

Traditionally structured companies may find it hard to make significant savings early on because their decision-making processes are too slow. Saving energy is a 24 x 7 operation, and thousands of pounds could be wasted while the wheels of the corporate 'machine' slowly turn. Companies that are serious about making savings will find that it is far better to follow Solutia's pro-active approach and appoint an energy manager who could bridge the gap between the board room and the boiler room.

Background

Solutia UK Ltd is a chemical manufacturing company based in Newport, Gwent. It has seven manufacturing plants on its 320-acre site; 230 employees; and operates 24 hours a day, 365 days a year. The company's processes are energy intensive and its annual business energy bill is in the region of £2.5 million.

Get commitment

In 2001 Solutia's site manager began to investigate the impact the Climate Change Levy might have on the company's bottom line, and his findings were unpalatable. His review prompted the company to appointment an energy manager, from within its existing environmental team, tasked with mitigating the effect of the CCL.

Solutia formed a partnership with Action Energy. This began with a free on-site seminar presented by an energy specialist. The senior management team, representing all departments, attended the meeting, where they heard about the potential impact of the CCL, along with the financial benefits that could be delivered through a concerted energy saving strategy. This persuaded them to embrace the energy-efficiency challenge. The meeting also provided a suitable platform from which the energy manager could begin a round of personal meetings with staff to gather ideas for energy-saving actions, while simultaneously raising awareness that good housekeeping can make a significant contribution to overall savings.

For example improving maintenance of the company's compressed air plant now saves around £10,000 per year – a saving that goes straight to the bottom line.

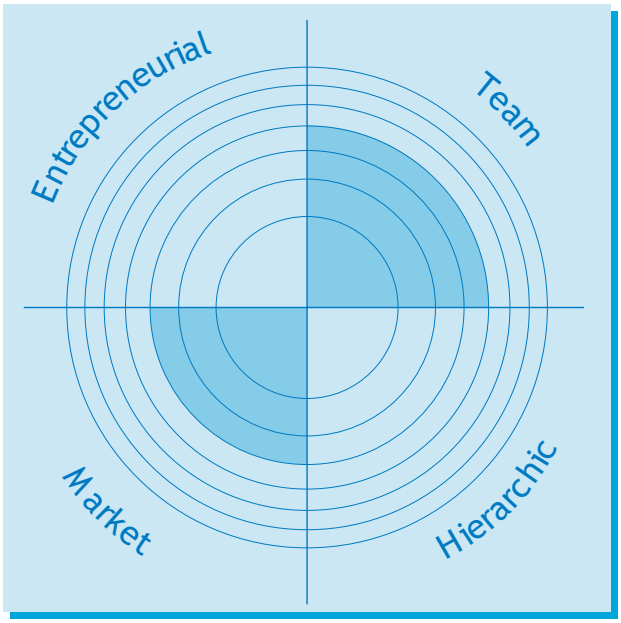
Understand

Having no money to spend on new plant or technological fixes, Solutia's energy manager Keith Agnew understood the need to "do the basics better through people", and he embarked on a proactive campaign to secure and maintain the participation of all staff in energy saving. Ultimately he aimed to turn all 230 staff into energy managers! He also recognised the importance of monitoring energy consumption along with the progress on actions. He made sure that he fed this information back to the production line with sufficient regularity to enable timely actions to be taken.

The potential financial benefits were considerable and comprised:

- the value of the energy saved + the value of the CCL rebate + the income achieved by emissions trading if the carbon saving exceeded the level set out in a climate change agreement.

While reducing the impact of the CCL was the main driver, Solutia's energy strategy had other benefits including helping it achieve IPPC authorisation and contributing towards the aims of the environmental policy.



Solutia's Company Culture Diagram

Plan and organise

Part of Solutia's environmental policy states:

"We will continuously improve our raw materials and energy utilisation efficiency to reduce our impact on the environment and improve the sustainability of our business."

This forms the basis of the company's energy plan

The energy plan is not a traditional paper document listing objectives; it is a working document, based on a spreadsheet that is constantly changing and being updated. The spreadsheet is used to identify opportunities, allocate actions, track progress and accept utility invoices.

A key element of Solutia's strategy was to enter into an industry-specific climate change agreement under which it agreed targets for energy saving in return for an 80% rebate on the CCL, if successful.

Implement

Keith Agnew delivered presentations to all staff in their workplace, explaining the targets and their importance. This required 35 presentations, each tailored to the area of the site concerned, in order to truly raise awareness and use the knowledge that already existed within the workforce. The meetings encouraged staff to identify opportunities for energy saving, and the actions that resulted were entered onto the energy plan.

All production managers were given the goal of achieving reductions in energy consumption in their area of the site. Staff motivation was maintained by using the energy plan to track actions and by feedback on performance from the site's monitoring and targeting (M&T) system.

Control and monitor

Solutia has its own spreadsheet-based M&T system, which tracks over a hundred key indicators each day. This automated system monitors each production unit, using energy data from existing meters, and feeding data back into the spreadsheets. This identifies 'exceptions' as soon as they occur, making investigation and rectification much easier.

In Solutia's environment where the type of product on each production line can change daily this is the only viable approach, because a monthly M&T system would smooth out the data, masking areas of potential saving, and making investigation difficult.

Monthly reports summarising energy consumption, identifying improvements in performance and actions taken are prepared and an energy presentation is delivered to the site leadership team at each monthly management meeting. This level of commitment maintains a high profile for energy and ensures continuous improvement.

An annual energy report is also prepared for DEFRA in accordance with Solutia's climate change agreement.

A successful strategy

Solutia's energy strategy has paid dividends, with a 13% reduction in absolute energy usage in the first year of its campaign (2000-1). This has sliced around £350,000 off the company's typical £2.5 million annual energy bill. Savings like this, says Mike Rees, Solutia's finance director, can translate into a lower product cost and could ultimately be the difference between winning and losing a contract.

This significantly exceeded the target of a 4% saving by the end of 2002 agreed with DEFRA under the climate change agreement. Savings continue to grow and Solutia's energy manager Keith Agnew is confident that their second target of achieving a 33% saving by 31st December 2004 is achievable, even though he has no money to spend on new plant or energy-saving technology.

For Solutia, the key to success is the energy manager's dynamic approach and drive. His regular contact with all production staff to encourage and motivate continues to ensure that good practices are implemented and replicated in other areas of the site.

The beauty of Solutia's approach is that it hasn't cost the company a penny. In fact, its energy-saving strategy is destined to become a revenue generator. This is because the company is party to an industry-specific climate change agreement whereby chemicals manufacturers agree to abide by bi-annual national energy-saving targets. Companies that exceed their targets can sell these to others who will not meet their savings goals in the newly formed Carbon Trading market. In fact, Solutia is the first company in its sector to take advantage of this market using forward trading, having already sold the vast majority of its 'carbon saving' at £11 per tonne.

	Energy policy	Organising	Motivation	Information Systems	Marketing	Investment
4						
3						
2						
1						
0						

Solutia's energy management matrix

Case Study | 2

The University of Sheffield

"Maintaining the support of our 20,000 students and 500 staff has been key to our success. This cannot be achieved by a one-off awareness campaign, and we have used a constant drip feed of information by e-mail bulletins, press releases, newsletter articles, staff induction and via our web site to achieve this."

The vast number of people and the perpetually changing population at Sheffield University mean that awareness-raising is a never-ending task. The energy manager has used a combination of modern communications plus tried-and-tested management techniques to keep a grip on expenditure and to keep the policy fresh and successful.

Background

The University of Sheffield has been a higher education establishment since 1905; it now has over 70 academic departments, 68 research units, 20,000 students and 5000 members of staff. The combined energy and water bills in academic and residential buildings total £3.5million per annum.

Get commitment

In 1997, following a benchmarking exercise of energy and water consumption, the University identified scope for savings. This prompted the appointment of an energy manager later that year, tasked with achieving best value and financial savings. The support of the Vice-Chancellor was secured through the University's committee system, and he subsequently endorsed the energy policy. He also signed up to the government's 'Making a Corporate Commitment' campaign in 1998.

Understand

The benchmarking exercise in 1997 had compared the University's performance with benchmarks produced by HEFCE (Higher Education Funding Council for England) based on the performance of similar establishments.

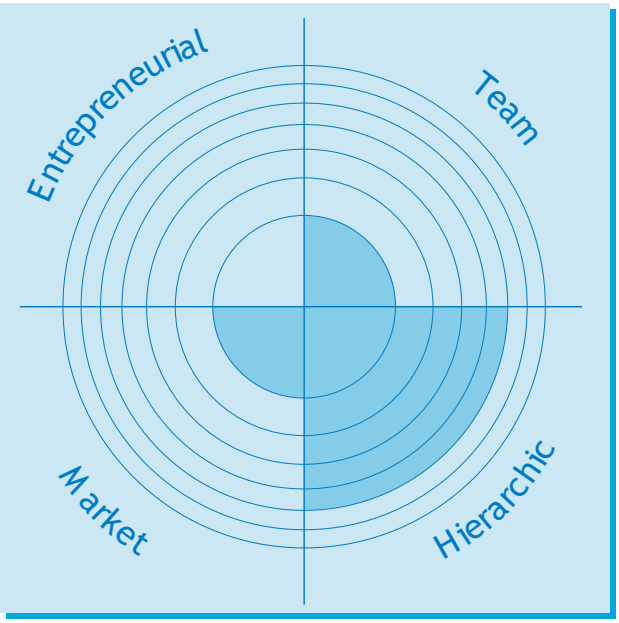
The scale of the energy manager's task was considerable - with over 3000 utility invoices being received each year, covering 250 buildings. The influence that the 25,000 people at the University had on energy consumption was also apparent and securing their support was critical, particularly as much of the site's energy consumption was associated with research projects in addition to traditional building services.

Plan and organise

Realising that energy management could be self-financing, the energy manager's salary and funds for energy-saving projects were allocated from the annual utility budget. This arrangement is still in place.

The energy manager, Phil Riley, developed an energy strategy based on the five-step approach discussed in this Guide. He developed an energy policy that had a long-term objective of achieving a continuous improvement of 2% each year. The policy was published and posted on the University's web site.

The energy manager is responsible to the Environment Sub-committee and reports on progress three times a year.



The University of Sheffield's Company Culture Diagram

Implement

Phil Riley arranged for an energy survey of the site, carried out free of charge under the Action Energy programme, and this identified potential savings of 14%. The survey was followed by a more detailed survey of one of the buildings where problems with the heating and ventilation system had been identified.

A number of energy saving schemes were implemented as a result of the survey and suggestions from staff and students. These include automatic lighting controls, insulation, adjustments to heating controls and water conservation devices.

Phil Riley recognised that, with a new influx of students and changes to staff each year, awareness and motivation activities have to be on-going, with a continuous 'drip feed' of information and encouragement. Awareness is maintained by regular e-mail bulletins to all 25,000 staff and students, and regular updates on the University's web site. This is underpinned by a team of 'energy liaison officers', covering a number of departments, who serve as a point of contact and who pass on information and advice to building users. Everyone is encouraged to make suggestions for energy saving, either directly to the energy manager by e-mail, through the Estates Department help desk, or via the energy liaison officers.

In addition, energy awareness training is included in induction training for all new staff within the Facilities Management Directorate.

Control and monitor

Monitoring and targeting (M&T) software is used to handle the 3000 utility invoices that the University receives each year. An increasing number of invoices are received electronically and are automatically verified by the software. The software analyses the energy consumption data and uses 'exception reporting' to flag increased consumption which should be investigated.

Phil Riley reports on progress to the University's environment subcommittee three times per year, and this is followed by an annual report summarising achievements, savings made and plans for the following year. These reviews aim to ensure that the University achieves its goal of continuous improvement.

The energy manager also reviews the design of new buildings with the Estates Department in order to ensure that life-cycle energy costs receive due consideration before designs are accepted. As with other energy issues, this process is on-going.

In 2003, the University carried out a major review of its energy policy in order to assess performance against the original objectives, set new objectives and review the content of the policy.

A successful strategy

The University has consistently exceeded its target of a continuous improvement of 2% per annum. In the first three years, an overall saving in energy and water of 10% was achieved. After five years, following the completion of a water-saving project, a reduction in water consumption per student of 28% was achieved.

In keeping with its aim to operate in a sustainable manner the University purchases electricity from renewable sources wherever possible. The proportion of green electricity purchased has risen steadily over the past three years and it is hoped that all its requirements will be met from sustainable sources in the near future.

	Energy Policy	Organising	Motivation	Information Systems	Marketing	Investment
4						
3						
2						
1						
0						

The University of Sheffield's energy management matrix

Case Study | 3

NRM
NATIONAL
RAILWAY
MUSEUM

The National Railway Musuem

"We know that energy-saving techniques can help us achieve our goals, in more ways than one."

The aim of a museum is to conserve its collections and at the same time make them more accessible to the public through new displays, events and education programmes. Funding is often tight, and largely governed by external factors, so any energy cost savings are very welcome because they can be used elsewhere.

Background

The National Railway Museum (NRM) in York, which celebrated its silver jubilee in 2000. It is the home of Britain's world-class collection of engines, carriages and related machinery, including: 103 locomotives and 177 other items of rolling stock. The York site also houses some 3300 models, 6500 items of silver and crockery, over 300 nameplates, 350,000 tickets, 350,000 engineering drawings, 7500 posters, and 200 original works of art. The museum has an annual energy bill of approximately £130,000.

Each year around 800,000 visitors come through the museum's doors and at peak times there are more than 7,000 visitors per day.

In 2001, the museum achieved international recognition and won the European Museum of the Year Award.

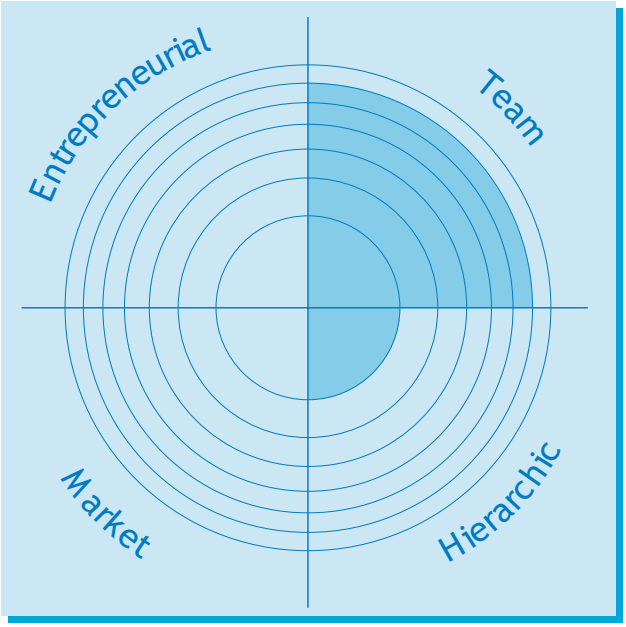
Get commitment

The NRM's commitment to energy management began in 1991 shortly after Robert Ormston became estates manager. He had previously been involved in energy management, and had a clear understanding of the benefits and the need for commitment from the top of the organisation. He persuaded the museum manager that saving energy would bring financial, environmental and staffing benefits. The museum set up an energy committee, and an environment committee, both of which had strong support from senior managers. A formal energy policy was adopted in 1995.

Understand

With budgets becoming tighter, every pound saved on energy could be spent in other important areas. The museum has been expanding rapidly since 1991, and this has highlighted the need for energy efficiency and the inclusion of energy-saving technology wherever possible.

The museum also recognised its social responsibility and the need to minimise its environmental impact.



NRM's Company Culture Diagram

Plan and organise

The Museum's energy committee, chaired by the museum manager, comprised key individuals who could influence energy consumption, including the head of estates, head of security, and head of design. An external energy consultant was invited to attend meetings to provide expert advice and support.

The NRM took advantage of a free energy survey under the Government's Action Energy programme, and when the opportunities have arisen its recommendations have been implemented.

Implement

The museum's energy policy was issued to around 300 staff and volunteers. In addition, its objectives, along with other sustainability issues, were communicated to all new recruits as part of their induction programme, which includes visits to departmental heads. When visiting the Estates Department, new recruits learn about the NRM's commitment to energy saving, the site's building management system (BMS) and its benefits, and how individuals can contribute towards energy saving.

Staff and visitor support is essential, but technology has been harnessed to support their efforts. The most important element of this was the BMS which was installed around twelve years ago, and which has been developed and expanded in line with the site expansion. The BMS was initially used to control the greatest energy user – lighting and heating. However, it has since expanded to become an integral part of the museum's operations.

The BMS controls lighting in all key areas so that the number of lights that are switched on suits operations within the museum at any given time. For example, the estates facilities officer worked with the cleaning team to understand their working patterns, then programmed the BMS so that lights are on only in those areas where cleaning is taking place. The BMS switches the display lights and 'house lights' on just in time for opening at 10.00am. When the last visitor has left at closing time, it automatically switches back to the security or cleaning programme. Automatic on/off control has released staff time to perform other essential duties.

The BMS's alarm link to essential equipment and systems ensures that failures are dealt with quickly, preventing adverse effects on the staff, visitors and the collection.

There are some areas, such as offices, that are not fully linked to the BMS. Here, the more traditional method of raising staff awareness and good housekeeping are used.

When plant and equipment are replaced contractors are encouraged to make a case for more energy-efficient replacements; and when a new gallery – 'The Works' – was built four years ago, the NRM ensured that energy use was considered during both design and construction. This space incorporates high levels of insulation and low-energy lighting controlled by the BMS.

The museum also ensures that energy and sustainability are on the agenda for new and on-going projects. Examples of this include: evaluating the possibility of introducing combined heat and power (CHP); decentralisation of domestic hot water systems; rainwater harvesting; use of wind turbines and battery operated vehicles.

Control and monitor

The BMS is used to remotely read several energy meters across the NRM's 23-acre site and its data is used to help produce energy reports and feedback information on energy consumption in each area of the site. This data is displayed on notice boards in graphical format and helps maintain motivation and commitment.

The museum's energy committee has viewed energy saving as an on-going process. Its role has been to offer

	Energy Policy	Organising	Motivation	Information Systems	Marketing	Investment
4						
3						
2						
1						
0						

NRM's energy management matrix

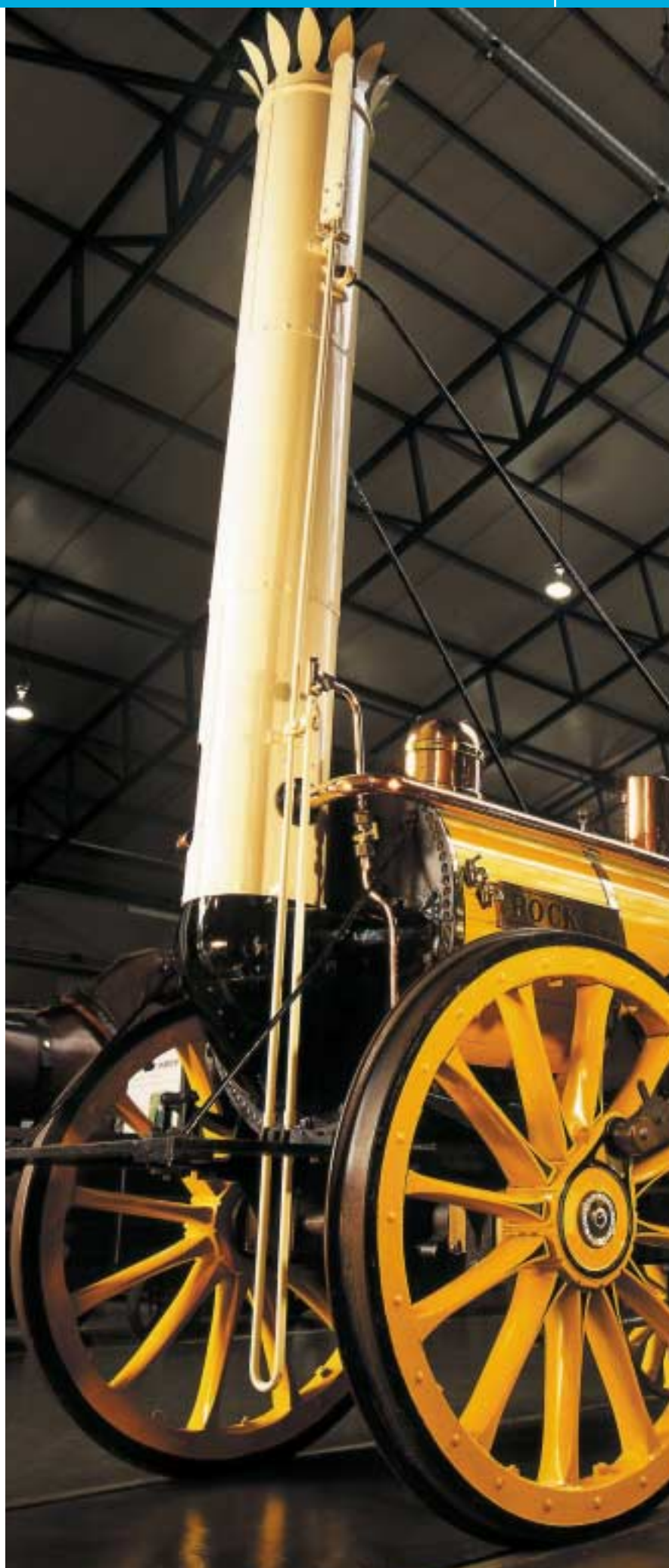
guidance, to take forward suggestions, to investigate options and then arrange for approved work to be completed. The approved work is monitored and evaluated for performance and the information is used to ensure that new project specifications include the successful suggestions.

A successful strategy

During the mid-1990s, the museum's energy management strategy provided annual savings of approximately 23% of the energy bill. Since then the museum has grown, with the construction of a 4,000-square-metre extension. This has increased the energy bill to its current level of approximately £130,000 per annum, which is significantly lower than it would have been without NMR's concerted efforts.

Further evidence of the success of NRM's approach is that the National Museum of Science and Industry (which includes NRM, the Science Museum in London, the National Museum of Photography Film and TV, Wroughton Airfield near Swindon; and a new development in Shildon, Co Durham) has adopted a new 'energy and sustainability initiative' modelled on NRM's approach. Each museum now has a 'Green Team' to progress sustainability, environmental and energy issues.

The NRM has also obtained a substantial grant from the Energy Savings Trust to install roof-mounted photovoltaic panels to power the interactive displays at its new development in Shildon.



Case Study | 4

United Co-op

"The United Co-op's approach is one of recognition and reward, founded on three concepts – procurement, technical expertise and people."

Retailers use large amounts of energy, the cost of which often represents the third largest controllable overhead in the business. Few take energy seriously or adopt energy management principles, but United Co-op has embraced energy management and has achieved an energy aware culture. The Society has made large energy cost and consumption savings, reduced pollution and become a leader in retail energy management.

Background

Studies have found that 57% of retailers don't know their total energy costs and do nothing; a further 19% know their costs and still do nothing. On the other hand, 11 per cent carry out some energy monitoring, six per cent apply some energy management and only seven per cent have a specialist energy manager.

United Co-op is a retailer who is leading the way in energy efficiency. It has 942 retail outlets across the UK comprising supermarkets, convenience stores, healthcare outlets, funeral parlours and travel retail branches. Its total utility spend is approximately £11 million per year, with 80% of this being electricity costs.

Get commitment

Senior management recognised the business benefit of energy management and supported and funded the energy team. In particular, they were aware of the positive impact that their commitment to green and sustainability issues would have on their customers.

This led to the appointment of a dedicated energy manager in 1997, and in the following year the Chief Executive demonstrated his commitment by signing up to the government's 'Making a Corporate Commitment Campaign' (MACC) at United Co-op's management conference. This commitment continued and MACC 2 was signed in 2002.

Understand

United Co-op recognised that significant savings were achievable, provided that a strategic approach to energy management was followed. Due to the size of the organisation it was critical to gain the assistance of individuals at each site in implementing the energy strategy. The energy manager, Keith Maloney, was charged with carrying out a comprehensive review across all group operations.

Plan and organise

Following the review, the Board approved a comprehensive energy management programme, including the creation of a steering group led by the property group's general manager. All the Society's major businesses were represented on the group.

The size of the organisation meant that the energy manager would need the assistance of others in rolling out the energy management programme and energy task groups were set up in each part of the business. In addition, smaller groups or 'local energy champions' were hand-picked to achieve maximum effect and then trained and given responsibility for their own sites.

Implement

Staff and contractors received energy awareness training via poster competitions, incentive schemes, staff energy booklets for each trading group, newsletters, road shows and workshops. Every store manager participated in an intensive training programme.

Individual site managers became accountable for their energy performance. Targets were set and results rewarded, initially by recognition, but later by remuneration based on measured financial improvement.

In 1998, as part of the drive to manage energy and water consumption, store managers were asked to achieve a 10% reduction in costs and consumption over a five year period. A further 5% reduction is now being sought in the next five year period ending in 2005.

	Energy Policy	Organising	Motivation	Information Systems	Marketing	Investment
4						
3						
2						
1						
0						

United Co-op's energy management matrix

A comprehensive range of technical measures has been implemented to improve energy efficiency. These include air leakage testing, new lighting schemes (including high-frequency fluorescent lights, with dimming controls), waste water prevention devices, computerised building management systems, improved refrigeration systems and oil-to-gas conversions.

Group procurement of electricity gas and oil has resulted in significant cost savings. United Co-op has adopted a policy of buying 'green energy' and 1% of the total electricity used comes from wind turbines.

Control and monitor

United Co-op set up an M&T system based on commercially available software package, which enables energy and water consumption of all sites to be monitored and analysed. The system generates monthly reports for individual businesses, site-specific reports and board-level reports. These are circulated to relevant personnel, providing up-to-date, information and a visible measure of progress. The system also generates league tables which, in several instances, have highlighted anomalies when comparing sites of similar size and function. Subsequent investigation has led to significant savings.

Monthly reports are presented to the board, along with an annual report summarising performance and achievements during the year. This provides accountability and serves to ensure that the Society remains on course to achieve its published energy targets.

At individual site level the 'Energy MOT' is used to check on the energy efficiency of a store. This is carried out by the 'energy champion' and provides a means of moving towards continuous improvement. The test involves 32 checks divided into four main categories covering: staff awareness, good housekeeping, energy information and maintenance. Points are awarded for each check and sites must score 90% to achieve the MOT.

A successful strategy

The financial savings to date equate to over £2million, and have provided the basis for a firm public declaration of the organisation's commitment to reducing the environmental impact of trading activities. United Co-op has also publicly declared targets for energy cost and consumption and CO_2 reduction.

The organisation has achieved a number of awards, including:

- npower award for outstanding energy conservation
- MEUC 2000, four runner-up awards for best energy management strategy; best energy and environment campaign, best use of electricity and best energy management programme
- Green Steps environmental award 2000 from City of Stoke on Trent Council.

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www.actionenergy.org.uk

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